This study explores the use of MXenes, a family of 2D transition-metal carbides and nitrides, in developing highly sensitive gas and pollutant sensors. Beyond their conductivity and surface adaptability, the research addresses key challenges - such as oxidation instability, limited selectivity, and low scalability - and outlines methods like surface modification and heterojunction design to improve performance.

The paper also examines MXenes' broader environmental applications, emphasizing their potential for detecting industrial pollutants and atmospheric toxins.